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SHORT REPORT

A Short Big Toe

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Osteomyelitis in the diabetic foot is a difficult problem and results from peripheral neuropathy, vasculopathy, and an impaired immune system. Peripheral vascular disease causes greater destruction of the bone and surrounding tissue and delays eradication of infection by preventing delivery of nutrients, oxygen and antibiotics to the infected area. The end result of diabetic foot infection and osteomyelitis is limb amputation. This case illustrates the healing of osteomyelitis following successful revascularisation without excision of the infected bone and how amputation and permanent deformity can be avoided leading to a fully functional foot.

Keywords: Osteomyelitis foot; Diabetic foot; Revascularisation.

Introduction

Osteomyelitis of the foot is a common and serious problem in diabetic patients. Peripheral vascular disease is common in this group and causes greater destruction of the bone and surrounding tissue, necessitating removal of the bone. Restoration of the vascular supply removes one part of the triad responsible for severe diabetic foot infections.[1] This allows the diabetic patients to combat the infection and emerge with a healed extremity that prevents unnecessary amputations. We report a case of 65-year-old man with osteomyelitis of the first metatarsophalangeal joint and peripheral vascular disease was treated with vascular bypass surgery, wound debridement, antibiotics and no amputation.

Case Report

A 65-year-old man was admitted with a 2-month history of a non-healing ulcer of the right first metatarsophalangeal joint. He also complained of claudication pain in the right calf at a distance of 200 yards. He was known to have insulin dependent diabetes mellitus, hypertension and he also smoked. On admission he had a temperature of 37.8 °C and a $2\times2\,cm^2$ ulcer located on the plantar aspect of the right foot over the head of the first metatarsal extended to the bone and the metatarsophalangeal joint with surrounding cellulitis. The initial blood investigations revealed a raised WBC of 16.2 and C-reactive protein of 156. A plain X-ray confirmed complete osteomyelitis with destruction of the first metatarsophalangeal joint. Doppler ankle brachial pressure index was 0.36 on the right compared to 0.62 on the left leg. A wound swab grew *Staphylococcus* and he was commenced on intravenous vancomycin.

A femoral angiogram revealed a 5 cm occluded segment of the right superficial femoral artery with reasonable two vessels run off. Six days after admission he underwent an uncomplicated right sided femoral to below knee popliteal bypass surgery using a reversed saphenous vein as a conduit. The infrapopliteal artery was in continuity with patent pedal arch. He also had superficial debridement of the ulcer; no bone was excised. He received intravenous antibiotics for 2 weeks and had an unremarkable postoperative course. He was mobilised with the help of crutches to take pressure off the ulcer and discharged on oral antibiotics for another 6 weeks. Six months following bypass surgery he did not

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Fig. 1. A shortened but preserved big toe secondary to osteomyelitis.

Fig. 2. Foot X-ray shows metatarsal destruction but no active infection.

claudicate, the ulcer had disappeared with resultant shortening of the big toe (Fig. 1) and there was no radiographic or clinical evidence of osteomyelitis (Fig. 2). He does not require any specialised footwear despite the shortening of his great toe and he walks normally. At 2-year follow up, a Doppler ultrasound showed a patent graft and he remains well with no clinical recurrence of his osteomyelitis.

Discussion

Foot infection in diabetic patients is a difficult problem. Approximately 15% or more of patients with diabetes will have a foot problem during their lifetime.[2] This is often the end result of combination factors of sensory neuropathy, defective chemotaxis, abnormal phagocytosis and decreased bactericidal function.[1] The hyperglycaemic environment in diabetic patients becomes a culture media for bacteria and cause defects in leukocyte function. Osteomyelitis in patients with diabetic foot infection is common and should be suspected if inflammation or ulceration is resistant to treatment. During this inflammation the vascular channels are compressed and obliterated, and the resulting ischemia contributes to the bone necrosis. The very frequent co-occurrence of peripheral arterial disease further adds to the insult and delays eradication of the infection.[3] The diagnosis should be made on both clinical and imaging grounds.

The treatment options to treat osteomyelitis of the foot in diabetic patients are often controversial. A subtle balance between medical and surgical therapy is necessary to achieve a potential curative outcome. The treatment depends on the vascularisation of tissue at the infected site and the extent of the local infection.[4] The poor penetration of antibiotics to the infected bone tissues could explain their poor efficacy in treatment of osteomyelitis. Urgent surgical debridement of the infected and necrotic tissue followed by a revascularisation procedure will expedite healing, shorten convalescence, and reduce hospital stay.[1]

It has been shown that diabetics have significant vascular disease of the tibial-peroneal trunk and calf vessels, but pedal vessels are often spared.[5] The sparing of pedal vessels facilitates limb salvage procedures. Restoration of the vascularisation to the foot allows good antibiotic penetration, shortens the healing times and prevents unnecessary bone resections. The bone saved with this conservative method will allow the patient to maintain optimal function of the preserved foot.

This case illustrates that efforts to improve the blood supply of the foot to heal a focus of osteomyelitis can be ultimately rewarding, rather than a disabling primary amputation of the affected toe.

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